

[NON-VOLATILE MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME]

Abstract

A non-volatile memory device and method of manufacturing the same is provided. A substrate is provided and then a trench is formed in the substrate. Thereafter, a bottom oxide layer, a charge-trapping layer and a top oxide layer are sequentially formed over the substrate and the surface of the trench. A conductive layer is formed over the top oxide layer filling the trench. The conductive layer is patterned to form a gate over the trench. The top oxide layer, the charge-trapping layer and the bottom oxide layer outside the gate are removed. A source/drain doping process is carried out. Because the non-volatile memory device is manufactured within the trench, storage efficiency of the device is improved through an increase in the coupling ratio. Furthermore, more charges can be stored by increasing the depth of the trench.